

Remarks/Arguments:

Claims 1-7 are pending in the above-identified application.

Rejections under 35 U.S.C. § 102(e)

Claims 1, 2 and 5 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,100,743 to Park et al. ("Park"). Applicant respectfully traverses these rejections. For the reasons set forth below, Applicant respectfully contends that Park neither discloses nor suggests all of the features of claims 1, 2 and 5.

Claim 1 recites a feature which is neither disclosed nor suggested by Park, namely:

a forwarding leading groove engraved on an outer wall of the main shaft, and having a first end communicating with the centrifugal pump and a second end communicating with an annular lubricant groove provided on an upper end of the bearing;

a reverse leading groove having a lead directing in an opposite direction to that of the forward leading groove, a first end communicating with the centrifugal pump, and a second end directly opening to the annular lubricant groove . . .

These features are found throughout the originally filed application and particularly, for example, on page 4, lines 16-22 and in FIG. 2.

The above-identified application describes a compressing mechanism 111 having a shaft 127 that comprises a forwarding leading groove 137 and a reverse leading groove 139. (See Application, page 4, lines 3-5 and 10-13.) The bottom end of forwarding leading groove 137 communicates with a centrifugal pump 133. (See Application, page 4, lines 16-18.) The top end of forward leading groove 137 opens directly to an annular lubricant groove 141. (See Application, page 4, lines 16-18.) The top end of reverse leading groove 139 also opens directly to annular lubricant groove 141. (See Application, page 4, lines 19-20.) During operation, lubricant is pushed to the outer rim of annular lubricant groove 141 by centrifugal forces, thereby reducing the amount of oil flowing into reverse leading groove 139. (See Application, page 5, line 12 - page 6, line 2.)

The Office Action asserts that the description in Park of helical grooves 343a and 343b and a collar 113 (collar 313 in FIG. 15) discloses the above quoted features of claim 1. For the reasons discussed below, Applicant respectfully disagrees.

With respect to FIGS. 15 and 16 of Park and the relevant description at col. 15, line 4 - col. 18, line 7, Park describes a compressor comprising a crank shaft 300 that comprises a driving shaft 310. (See Col. 15, lines 18-19.) Shaft 310 includes an oil groove 343. (See col. 15, lines 30-32.) In an embodiment of oil groove 343 illustrated in FIG. 15, oil groove 343 comprises two independent helical oil grooves 343a and 343b. (See Col. 16, lines 6-10) In another embodiment of oil groove 343 illustrated in FIG. 16, oil groove 343 comprises two joined helical oil grooves 343a and 343b. (See Col. 16, lines 10-13.)

In FIG. 15 of Park, the bottom ends of grooves 343a and 343b communicate with respective, separate holes 342a that pass through shaft 310 to communicate with oil holes 341, which are cavities located within shaft 310. (See Park, FIG. 15.) The top ends of grooves 343a and 343b communicate with holes 342b that pass through shaft 310 to communicate with respective pin oil holes 344a and 344b. (See Park, FIG. 15). Pin oil holes 344a and 344b are connected to shaft oil holes 341. (See Park, col. 16, line 61 - col. 17, line 5.)

In FIG. 16 of Park, the bottom ends of grooves 343a and 343b are joined together at a hole 342a that passes through shaft 310 to communicate with oil hole 341. (See Park16, lines 35-42 and FIG. 16.) The top ends of grooves 343a and 343b are joined together at a hole (not labeled, but presumably hole 342b) that passes through shaft 310 to communicate with pin hole 344. (See Park, FIG. 16; see also Park, col. 15, lines 57-60.)

Claim 1 recites "a forwarding leading groove engraved on an outer wall of the main shaft, and having a first end communicating with the centrifugal pump and **a second end communicating with an annular lubricant groove provided on an upper end of the bearing**" and "a reverse leading groove having a lead directing in an opposite direction to that of the forward leading groove, a first end communicating with the centrifugal pump, and **a second end directly opening to the annular lubricant groove.**" (Emphasis added.) In Park, the top ends of grooves 343a and 343b communicate with pin hole(s) 344 via hole(s) 342b. There does not appear to be any opening or communication of grooves 343a and 343b with collar 313 (or collar 113), as asserted by the Office Action at page 3, lines 1-2. Thus, Applicant respectfully contends that Park does not disclose or suggest "a forwarding leading groove . . . having . . . **a second end communicating with an annular lubricant groove provided on an upper end of the bearing**" or "a reverse leading groove having . . . **a second end directly opening to the annular lubricant groove,**" as recited in claim 1.

Further, in Park, collars 113 and 313 are bearings that support respective driving shafts 110 and 310. (See Park, col. 7, lines 53-55 and FIGS. 2, 15, and 16.) In particular, Park describes that collar 113 "forms a thrust bearing . . . to support an axial direction load during operation." (See Park, col. 7, lines 49-51.) A bearing is not an annular lubricant groove, as a "bearing" connotes material, but a "groove" connotes lack of material. Accordingly, Applicant respectfully contends that Park does not disclose or suggest the "annular lubricant groove" recited in claim 1.

For the foregoing reasons, Applicant respectfully asserts that Park does not disclose or suggest all of the above-quoted features of claim 1. Withdrawal of the rejection and favorable reconsideration and allowance of the claim are respectfully requested.

Claims 2 and 5 depend from claim 1 and therefore include all of the features of claim 1. For at least the same reasons as discussed above, Applicant respectfully asserts that Park does not disclose or suggest all of the features of claims 2 and 5. Withdrawal of the rejections of these claims and favorable reconsideration and allowance of these claims are respectfully requested.

Rejections under 35 U.S.C. § 103(a)

Claims 3, 4, 6, and 7 are rejected under 35 U.S.C. § 103(a) as being obvious over Park in view of U.S. Patent No. 6,457,561 to Goodnight. For the reasons set forth below, Applicant respectfully contends that the portions of Goodnight relied upon in the Office Action neither disclose nor suggest the features of claim 1 missing from Park.

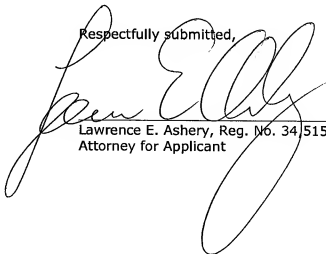
The Office Action cites to column 7, lines 5-10 and 30-40 of Goodnight as disclosing features of claims 3, 4, 6, and 7. These portions of Goodnight describe edges 48 and 50 of respective helical grooves 42 and 44. They do not describe features associated with an "annular lubricant groove." Thus, Applicant respectfully contends that the relied-upon portions of Goodnight do not disclose or suggest the above-noted material missing from Park.

For the foregoing reasons, Applicant respectfully asserts that neither Park, nor Goodnight, nor their combination discloses or suggests all of the above-quoted features of claim 1, from which claims 3, 4, 6, and 7 depend. Withdrawal of the rejections of claims 3, 4, 6, and 7 and favorable reconsideration and allowance of these claims are, therefore, respectfully requested.

Conclusion

For the foregoing reasons, Applicant respectfully submits that the claims are in condition for allowance and requests notification to that effect.

Respectfully submitted,



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